

ABSTRACT

A method and apparatus for monitoring and determining fuel vapor recovery performance is disclosed. The dispensing of liquid fuel into a tank by a conventional gas pump nozzle naturally displaces a mixture of air and fuel ullage vapor in the tank. These displaced vapors may be recovered at the dispensing point nozzle by a vapor recovery system. A properly functioning vapor recovery system recovers approximately one unit volume of vapor for every unit volume of dispensed liquid fuel. The ratio of recovered vapor to dispensed fuel is termed the A/L ratio, which should ideally be approximately equal to one (1). The A/L ratio, and thus the proper functioning of the vapor recovery system, may be determined by measuring liquid fuel flow and return vapor flow (using a vapor flow sensor) on a nozzle-by-nozzle basis. The disclosed methods and apparatus provide for the determination of A/L ratios for individual nozzles using a reduced number of vapor flow sensors. The disclosed methods and apparatus also provide for the determination of fuel dispensing system vapor containment integrity, and the differentiation of true vapor recovery failures as opposed to false failures resulting from the refueling of vehicles provided with onboard vapor recovery systems.